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19 May 2000

**MEMORANDUM**

**SUBJECT:** Comments on J H Baxter Remedial Investigation Report Draft, dated March 10, 2000

**FROM:** Rene Fuentes, Hydrogeologist  
Office of Environmental Assessment

**TO:** Cheryl Williams, Project Manager  
RCRA Compliance

I have reviewed the Draft Remedial Investigation Report (DRI) and some other background documents and letters related to this site, as you requested. Based on that information I have a number of comments on the DRI.

**General Comments**

1. A Remedial Investigation report should summarize all the information and data that is known and documented for a contaminated site, but this report ignores most of the data obtained prior to 1999. The investigation should also attempt to meet the objective of fully characterizing the site over the entire space and time of concern, which should include the entire facility history, and the likely distance which the contaminants may have traveled during that period. Since this DRI seems to have many major data gaps due to the limited sampling carried out, and also due to the limited period of time covered by the other data presented, both of these factors need to be addressed before this DRI can be considered a credible statement of the extent of contamination and a full characterization of the contamination from this facility. This report presents a conflicting picture -- there appear to be several major sources of contamination at this facility which would require a more detailed characterization to fully understand and remediate, but there is very limited contaminant sources and ground-water contamination characterization presented in the report. The DRI also appears to discount much of the currently existing and past contamination, both presently underneath the facility, and also probably uncontrolled releases that have gone beyond the facility boundary. This combination of factors produce a somewhat limited conceptual model of the extent of contamination caused by the sources at the facility. As presently written there is insufficient data used in this report to support the conclusion that there are not major contamination problems, given the

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many years of pentachlorophenol (PCP) treatment and the history of discharges and product spills at the site. Therefore, the concept that major contamination exists at the facility, and beyond the facility's boundary, must be maintained as the hypothesis from which we need to proceed with future work. That hypothesis has not been ruled out by the data presented thus far.

2. The site data presented in the DRI documents that concentrations of PCP presently vary widely within relatively short distances, as indicated most clearly by the monitoring points available near the "butt treating plant", where the concentrations range from 58,000 µg/L in BT-S-GW to 0.5 U µg/L in MW-1, during October 1999. This large variability within a short lateral distance (about 100 feet in figure 5) near one source area, indicates that it is unlikely that, given all the many known and potential sources at the site (spills, butt tank area source, and many french drains which drain the site directly into the ground water aquifer), a single off-site well (HCMW-7) is sufficient to characterize the potential plumes going off site. Similarly, there are too few data points to understand the on-site contamination.
3. There needs to be more vertical and horizontal definition in the contaminant sampling, not just, for example, one sample from a well which has a twenty foot screen length, in order to adequately characterize the vertical contaminant distribution so that supportable conclusions can be drawn from the data. PCP has a specific gravity much greater than water, and there should be some discussion of that characteristic in the text and the conceptual model, supported by sufficient vertical sampling to document that the PCP is not sinking, going below the monitoring well screens, and therefore, not being sampled. Similarly if the PCP and the oil are mixed in the treatment process, the DRI should consider a combined PCP/oil product which would then float as an LNAPL, and there should be discussion and sampling for LNAPLs in addition to the dissolved PCP sampling.
4. There is a lack of sufficient monitoring wells both on-site and off-site, especially given that there may be a ground water divide on the south side of the site, and the gradients do not seem to have been fully characterized for different seasons. The fact that the gradients turn from westward to northward near the butt tank area, and the fact that these gradients may still be shifting near the northern boundary of the site is one major cause for concern that the gradients have not been characterized sufficiently to understand the direction of flow of the contaminants. Similarly, there is no data to characterize the gradients from the south side of the facility.
5. The DRI contains a mixture of data sets which are not clearly comparable to each other, and it is not clear what the rationale for the selection of the sampling locations and method of collection was. For example, there are many borings in areas which are documented to be highly contaminated, but the only samples were taken of the boring water and no permanent monitoring wells were ever installed. In addition, it is hard to understand why samples taken of the water from the french drains were composited. Also, arguments were made that turbidity affects the concentration of the water which



infiltrates past the french drains, but no monitoring wells have been installed to provide data from those areas that would be comparable to data from other monitoring wells, so that this issue of contamination to the ground water can be verified or disproved based on data collected directly from wells. In addition, many wells have very long well screens, or are screened too deep, which probably decreases the reliability of the data obtained from those water samples. A more complete routine sampling schedule, with more consistent sampling points and sampling techniques, needs to be adopted by the facility to develop a reliable ground water data set, including collecting samples during different seasons and at different water levels.

6. It is not clearly documented in the DRI that other directions of surface or ground water flow (south or southwest) have been studied, but it is possible that there may be other flow directions from the site given an apparent surface water drainage basin to the south and a nearby City of Arlington pumping well west of the site. In addition to the DRI, the Stormwater AKART Analysis done for J.H. Baxter by AGI Technologies, dated July 30, 1997, states that "it is believed that the shallow groundwater table in the site vicinity serves as a steady recharge to Quilceda Creek and that discontinuing infiltration may have an adverse effect on the hydrologic cycle and ultimately on fish and wildlife." Therefore, this data gap needs to be filled to assure that there are no other directions of flow for the water and potential contaminants to leave the site.
7. There appear to have been numerous spills and/or disposal activities occurring at the site over its history. The number of french drains into the upper aquifer are numerous, are spread over a large area, and it seems that not all of these french drain discharge areas have been monitored in the ground water. This is a major data gap which will need to be filled in for the characterization to be considered acceptable.
8. It is implausible, given the many documented and potential source areas, that a couple of wells more or less randomly located can be expected to locate and adequately characterize the potential plumes. A more complete characterization, perhaps using some type of push technology sampling technique, should provide a better characterization of the areas of concern, vertically and horizontally, to determine whether there are major plumes above the clean-up criteria, where permanent monitoring wells should be located. Note that the MCL for PCP is 1 µg/L. Since, even with the limited data presented in the DRI, there are several locations near the edge of the facility where PCP has been documented at levels many orders of magnitude above that value, it should be expected that there are plumes exceeding the MCL in many locations.
9. It is clear that all the data available for the J.H. Baxter site is not included in the DRI, and this is misleading and unacceptable. Using other data report, such as the Stormwater AKART Analysis, which was generated for J.H. Baxter, or the Site Assessment Report from WDOE, it is easy to develop a totally different conceptual model of the site, including that contamination of the soil and ground water has occurred in multiple locations, and that the extent of that contamination should be beyond the facility



boundary. While the DRI seems to develop a very benign picture which shows MW-2 at the north end of the site with 2 µg/L of PCP in 1999 (Figure 20), the Site Hazard Assessment report, with Woodward-Clyde Consultants data tables, indicates a value of 150 µg/L in one well in 1990, and concentrations in another well of 440 µg/L at the property boundary in 1991. These two totally different data sets create two totally different conceptual models to use to study the site, and raises questions about the validity of the conclusions in the DRI regarding the potential extent of contamination. The present data set which has value of "ND" in HCMW-7, located as far north as MW-2, but located about 300 feet to the west may just indicate that the plume has not been sampled by this well. The ground water concentration for PCP of 2 µg/L at well MW-2 could mean any number of things, including that the data represents sampling just the end of the plume that moved away from that source area, or that the PCP plume is now above, below or to the side of the present water sampling depth or well location. The point of this comparison (1990 data to 1999 data) is that, at a minimum, all the data available for the site needs to be used to develop an acceptable RI. These data should be included in this report, and used with all the other data available, to create a more complete and realistic conceptual model of the potential extent of contamination. It is clear that there is also a need to do much more additional sampling to define the vertical and horizontal extent of the contamination.

10. Additional sampling should include PCP and potential break-down products and other potential contaminants of PCP. In addition, other contaminants, including potential by-products of PCP (such as chlorohydroquinones) should also be included since there is no evidence that indicates that if PCP has been degraded it is into more benign compounds. Future reports must also include more complete interpretation of the conventional parameters and major ions data, both as tracers and as supporting evidence of dilution or other mechanisms of attenuation. While some samples were taken for a few conventional parameters, and analyses were carried out by the laboratory, not much use is made of that data in this report.
11. It is not clear what samples have been taken for LNAPL and whether these samples have been analyzed for all the key parameters listed above (and including dioxins and furans). The report should separate and identify the different media (ground water, soil, NAPL, etc), areas sampled and parameters of concern in the text, the tables, and the figures. Once the data is presented in a form that it is easily found in the report, then composite concepts and figures can be created with all the relevant data sets to support them.
12. The maps used in the report indicate that they were created from a survey, but there needs to be a supporting table(s) of the field surveyed locations (state plane coordinates) for all the other key points shown on the maps (wells, borings, french drains, source areas, survey bench marks, etc.). Since there is no supporting evidence of any of these data, it is hard to determine the reliability of their mapped locations or any related feature features outside the facility map (distances, nearby houses and wells, etc.). This lack of



confidence on the uncertainty of locations adds a further complication to any calculations made to calculate travel times, size of plumes, and other such calculations.

13. I include in the specific comments listed below major issues which I have found with the DRI, but these comments are not supposed to take the place of the complete, formal MTCA review which I expect WDOE will do on the report submitted to them. However since there are so many problems and deficiencies I strongly suggest that a new draft be prepared and re-submitted for review before a final is submitted for agency acceptance. This revised document will probably still indicate further proposals for characterization, but it will present an entire picture of what has occurred at the site and the data to support the characterization to date. It would be helpful to have a list of where these comments are revised in the report.

#### **Specific Comments**

14. The report should have separate sections which discuss soil, ground water, and NAPL. It appears that some of the values presented should be LNAPL but they are not discussed as such in the DRI. The concentrations presented for BT-S-GW and BT-W-GW which are listed as ground water samples in Table B-3 (Chemical Results for Groundwater Samples), have very high concentrations of TPH and are likely to be LNAPL. I am providing this comment first and out of sequence with the other specific comments because I found the report hard to follow due to the mixing of media and how the data is presented in the text, tables, and figures. The report should be structured so that the reader does not have to hunt for the major data pieces which support the conceptual model of the site. In addition the report should include an electronic file with the data presented in it to allow different interpretations of the data presented.
15. Page 1. It is not clear what the three parcels are. Is parcel C the facility to the north which I have seen in a map?
16. Page 2. The scope of the investigation as presented in the scope of work seems very limited given the likely extent of contamination as explained above in the general comments, and unlikely to be sufficient to characterize the contamination.
17. Page 3. It is not clear how much PCP was spilled in the 1990 Butt Tank spill, or where that was disposed of after clean-up. That should be documented in the revised report. Similarly all other known past spills and disposal areas should be documented, and referenced to original documents. Similarly all known ongoing contributions to contamination on site should be documented.
18. Page 4. It is not clear that the "former butt treating thermal tank" area has been carefully located or fully investigated. Since this seems to be one of the major sources known to exist at the site it must be fully investigated.



19. Page 5. It is not clear why the infiltration was calculated assuming no runoff, and whether this is or is not expected to be more conservative for the contaminant migration. Also, if the precipitation occurs mostly in the winter in this area, and is routed to french drains, it is not clear why the majority of the precipitation is not considered as recharge, without a large proportion (about half of the precipitation in this case) being allocated to evapotranspiration. Since this is a facility with little vegetative cover, there is no reason to assume that most of the precipitation is not directly recharged to the aquifer.
20. Page 9. Text gives a flow rate range of 0.4 to 5 ft/day, which translates into 150 to 1500 feet per year. Such information should be used to determine what the likely extent of the PCP or degradation products of the plume could be since a documented plume was at the facility boundary prior to 1990.
21. Page 9. It is not clear where the lag time estimates come from or what it is based on. How is this related to the paragraph previous to it which has ground water flow rates of 150 to 1500 ft/yr? Does this estimate include the infiltration from the french drains which the facility has been using? Until this issue is resolved to the satisfaction of the agencies this paragraph should be removed because it is potentially misleading.
22. Page 11. The concept of using MTCA Modified Method B for the cleanup levels is simply an unacceptable concept. While the facility itself may be an industrial setting, the land adjacent to it is residential and the water supply wells need protection unrelated to the facility zoning. Therefore, this statement and related concepts must be removed from the DRI and the concept of using the ground water MCL of 1  $\mu\text{g/L}$  needs to be incorporated into the report for any areas beyond the facility boundary now, and for the entire aquifer after remediation of the contamination caused by the facility.
23. Page 15. Dioxin may be hydrophobic, but since PCP is normally applied as a mixture with oil there needs to be some more work to determine whether dioxin has migrated to the ground water with the oil mixture, and whether the oil/PCP mixture is remaining in site or migrating. It is not clear from the data collected if any LNAPL was sampled, and if it was, it is not clear if any LNAPL collected at the site has dioxin contamination. Similar issue for furans.
24. Page 16. It is interesting to note that in BT-W a product sheen was noted from the "shallowest sample to the deepest sample collected beneath the water table sample at 32 feet", but it is not clear why there were no more samples beyond 32 feet until there was no detection of contaminants in a vertical direction so that the complete vertical extent of the contamination could be determined and documented. It is unclear that this source area has been fully characterized. This appears to be another major data gap that needs to be resolved.



25. Page 20. The report states that PCP in MW-2 is "less than 10 µg/L", but as stated above, this seems to be based on a limited data set, and it is unclear whether the changes between these data and the 1990 data are due to true decreases or due to changes in sources or gradients from source areas to that well or to some other factor.
26. Page 20. While the concern about turbid samples may be true, such that more turbid samples give higher PCP concentrations, it should be noted that PCP is not expected to be present in normal soil background. Given that PCP may be correlated to turbidity, which is not necessarily accepted as valid given the correlation data presented in this DRI, it may be necessary to obtain more such "turbid" samples from wells and future sampling points to more carefully delineate the path of the contaminant plume in the past. At a minimum this should be carefully considered and discussed with the WDOE as a potential approach in the future studies at this facility.
27. Page 22. Again, the case is made that high PCP concentration may be associated with turbidity in MW-2. Since PCP is not expected to be found in background soils, unlike some metals, the presence of PCP should be taken as a source of contamination, and not as a sampling outlier which should be removed by changing to different sampling techniques.
28. Page 26. It is not very useful to debate the merits of PCP degradation based on modeling results since neither the site characterization, nor the modeling based on that characterization data can be considered very reliable at this point. There is no apparent reason to extrapolate that based on not finding high concentrations of PCP in a few wells there is sufficient data to determine biodegradation rates of PCP. In addition, as stated above, the degradation of PCP may only indicate that we have different toxic compounds which have been overlooked and which need to be included in future analyses.
29. Page 27. The issue of risk associated with PCP in ground water is not acceptable as presented. The characterization of the plumes needs to be continued and improved until we fully understand the extent and rate of migration of any PCP plume, and its breakdown products, and then determine whether there are any drinking water supplies or ecosystems endangered by it.
30. There should be a more detailed map similar to Figure 3 which includes all the supply wells in the area, and which documents in detail how the wells were or were not found. If Portage Creek is considered a discharge boundary for the plume it needs to be documented with actual ground water data. If the plume is likely to go beyond the Creek, then nearby wells found on the north side of it should also be included in the mapping and sampling. Similarly, if Quilceda Creek is determined to be a discharge boundary for the south side of the site similar concerns have to be investigated there.
31. Figure 5. It is unclear how the Penta Storage location can be placed at the northern end of the facility boundary and not to have any monitoring points around it. This area should



be considered a source area until proven otherwise. Some soil and ground water monitoring of that area should be considered, and if it has been done it should be included in the DRI. Similarly, there should be some monitoring wells near and to the west of the retorts and tank farm area.

32. Figure 6 and 7. The wells used for background BXS-4 and MW-4 seem to be much deeper relative to the water table surface than the other wells nearer to the treatment area. That may present a problem with the detection of any contamination from the Parcel B area and may make any comparison to background questionable.
33. Figure 6, 7 and 8. The water elevation in the wells has varied by many feet over the years presented (about 15 feet between 1994 and 1997 in some wells). This variability makes any comparison of water quality and gradients very difficult. To verify the actual gradients it may be necessary to install transducers or go to a more routine (weekly) water level monitoring schedule. Water quality may have to be compared to periods where the well has had similar water elevations rather than just to the previous water samples in order to provide reasonable comparisons of the data to show trends. It is not clear why BT-S and BT-W were not completed as monitoring wells since these borings appear to be located near the source areas. Wells in the source areas should be installed soon to attempt to characterize the sources and begin to have a data set of those areas.
34. Figure 10. It seems that this figure is somewhat optimistic at considering such limited data as a valid determination of the  $K_{oc}$ .